ATM | DESIGN ENGINEERING CONSULTING

MEMORANDUM

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To: Wild Dunes Yacht Harbor, Inc.
Attn: Ms. Laurie Schueler

From: Heath Hansell, PE

CC: ATM File

Date: December 22, 2020

Re: Wild Dunes Yacht Harbor Marina – Replacement Cost Estimate

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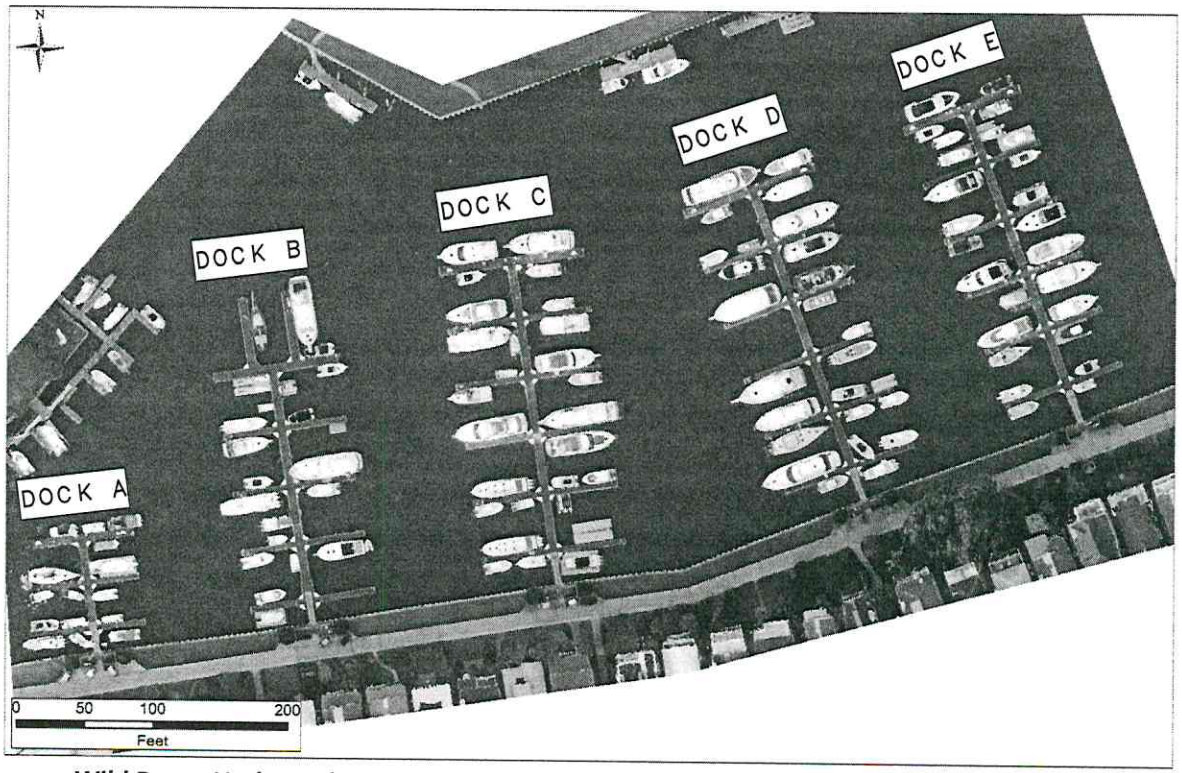
Applied Technology and Management, Inc. (ATM) was retained by Wild Dunes Yacht Harbor (WDYH) to conduct an overview marina assessment and develop a detailed replacement cost estimate. This memorandum summarizes our findings and attached is ATM's estimate to replace the existing Wild Dunes Yacht Harbor floating marina facility in its current configuration. The estimate is based on ATM's experience, contractor/supplier input and recent, comparable marina project bid and construction costs in the local area and surrounding region. At the request of WDYH, we have broken down the estimate on a per dock basis and also considered project phasing, code requirements, and other potential project impacts and alternatives.



Wild Dunes Yacht Harbor Overview (UAV Imagery Taken by ATM on November 18, 2020)

Marina Assessment

ATM reviewed the Wild Dunes Yacht Harbor Dock Study (dated December 14, 2014 and amended April 22, 2016) which provided a technical evaluation of the conditions of Docks A-E at the facility and included an electrical utility and underwater dock and piling inspection. That report generally concluded that although the docks were approximately 25 years old (except for Dock B which was approximately 16 years old) at the time of the report, the docks exhibited no potential critical failure issues, were in good condition, and had an estimated 7 to 10 years of remaining useful life (depending on future maintenance) but required continued maintenance to realize and extend this useful life.

On November 18, 2020, ATM engineers conducted an overview visual assessment of the above-water elements at Docks A-E. This assessment was not intended to be a detailed technical evaluation, rather an overview observation by ATM of the general physical site and any readily observable critical conditions. Specifically, any issues that may impact remaining life expectancy, life/safety concerns, and replacement cost estimate details.

ATM observed no critical life/safety issues at the facility during the assessment and found the facility in similar condition as represented in the 2014 report, with expected signed of continued aging. Continued, diligent maintenance may extend the useful life beyond the high-end 10-year estimate from the 2014 report (a 2024 end of service life). For planning purposes, ATM generally concurs with the original high-end estimate of remaining service life and recommends assuming a full or partial/phased replacement of the floating docks system within the next 5 years.

Dock Alternatives

There are several variations of commercially available floating docks products commonly used in marina construction. These include:

- Timber Frame Docks with Polypropylene (plastic) Tub Floats
  - Typically, the least robust but most economical with service lives of approximately 20-25 years.
- Aluminum Frame Docks with Polypropylene (plastic) Tub Floats
  - Considered more robust than timber frame systems, with typical service lives up to approximately 30 years.
- Aluminum Frame Docks with Concrete Floats
  - Similar to above with concrete floats in place of polypropylene tub floats. Primarily, these add more mass to minimize movement of docks in more exposed, higher wave conditions.
- Concrete Modular Units
  - Considered the most robust and higher end with service lives of 30 years or more.

Similarly, docks can be anchored using a variety of pile materials including timber, concrete, and steel. Decking on floating docks can also make use of a variety of materials (treated softwood timber, exotic hardwoods, composite, aluminum, or concrete, e.g.). The 2014 inspection report included a limited "swim-by" dive inspection of existing timber piles. No major issues were found at the limited number of piles observed. The piles, if in good condition, could theoretically be re-used for a new floating dock

system installation. However, in ATM's experience, there are a variety of factors that may discourage this, including:

- The small number of observed piles may not be representative of all piles.
- Pile observations are only able to see above the mudline. Pile damage may be present below the mudline.
- All piles would be required to be pulled and stored for re-use. Damage can occur during pile pulling and require new piles.
- New engineered floating dock systems (and their associated warranties) would typically require new piles be incorporated into their design and installation.

When viewed in light of the cost and expected service life of a new marina replacement project, potential cost savings for re-use of aged timber piles may not outweigh the benefit of new piles.

Different dock material types, re-use of existing timber piles, and similar items can all be requested as alternatives during project bidding to compare prices real time for contracting. ATM's cost estimate includes a base estimate for replacement using similar timber frame docks with polypropylene tub floats, new steel pipe piles, and add-on estimates for various dock alternatives.

Recent bid data referenced in developing the cost estimate is influenced by the current COVID-19 economic climate. Material prices have been significantly impacted depending on type, country of origin, and supply/demand, among other issues. Recent bid data revealed that US-based timber frame floating docks may be more costly than imported aluminum frame docks. This is contrary to typical order of magnitude relative unit costs typically assumed for floating dock projects. ATM's Base Price cost estimate assumes that the current COVID-19 related cost increases in US timber docks will eventually subside and return to pre-COVID-19 relative magnitudes (less than aluminum frame docks).

Building Codes

Cost estimates include installation of anticipated required new utility infrastructure in order to bring replacement docks up to current codes. In general, these codes are part of the National Fire Protection Association's (NFPA) requirements for marina fire suppression (NFPA 303), fixed standpipe systems (NFPA 14), and the National Electric Code (NFPA 70 NEC). Some existing utility infrastructures/appurtenances at the WDYH may be able to be re-used and repurposed (e.g., electrical sub panel housings, fire hose cabinets, etc.). These items are generally considered negligible in the cost estimate but may realize some savings when the project is let out to bid.

No specific "codes" govern typical performance specification and design of floating docks, but various industry accepted design guidelines and marine/coastal engineering standards are commonly implemented (e.g., ASCE 50 – Planning and Design Guidelines for Small Craft Harbors). Soft cost estimates include typical planning, permitting, and engineering to develop a replacement project ready for bid and construction. This includes evaluation of winds, wave, and wake exposure to various docks, flooding and sea level rise impacts, etc. Detailed structural design of floating dock systems is included in their unit cost for construction.

Phasing

In terms of a phased replacement program at the marina, this is certainly possible but will present additional costs and logistical/operational issues that should be considered.

Mobilization fees would be required for each project phase. These fees may be as much for each project phase as for the singular mobilization fee suggested in the attached estimate. Similarly, construction disturbances to adjacent slip holders and the Morgan Creek boating community at large would be impacted numerous times if construction is phased.

Labor and material cost increases can be expected for phases delayed further in the future compared to present-day work costs. Continued increases are consistent with what ATM has observed over the past several years in the industry and are also reflected in well-known national construction cost indices. Specifically, we note that the RS Means Historical Cost Index reflects an ~28% increase in general construction costs from 2010 to October of 2020 (~10-yr period) and an ~14% increase from 2015 to October of 2020 (~5-yr period). We anticipate construction costs to continue to climb as many members in the marina industry are laden with heavy workloads and backlog.

In terms of regulatory impacts to phased repair/replacement, a phased approach is common within the marina industry as well. State and federal agencies typically have simplified permitting processes for facility repair/replacement of infrastructure that is within the same footprint as existing. Phased replacement may require additional/multiple permitting efforts, but overall the process should be relatively straight forward and not much more cumbersome than pursuing regulatory approvals to replace the entirety of the marina. A complicating factor could be, however, changes to the footprint/layout of the marina basin. Proactive and open discussions with the regulatory agencies (federal, state, and local) are suggested at the outset of any dock/marina replacement or redevelopment program.

All of this said, phased repair/replacement projects in the marina industry are quite common. The overall replacement cost for the facility is substantial and not all docks in this marina are of similar age or have the same level of exposure or use. For instance, Dock B is newer and Dock A is less exposed, so these may not need replacement as soon as other docks. It may be prudent in a case such as this to pursue a phased replacement effort to mitigate overall costs and to maximize useful life of each dock tree in the marina. This should be studied carefully as the marina ages and/or the need to replace one or more areas of the facility becomes evident.

We have included a basic contingency number to account for unforeseen changes to the marina development climate between this point and replacement project(s).

Other Project Impacts

ATM also evaluated other potential impacts at the request of MCYH. They are addressed below.

- Bulkhead Project
    - Planning for some form of bulkhead rehabilitation or replacement is ongoing and the final proposed project is unknown at this time. Potential impacts include:

        - Competing construction operations. It is unlikely bulkhead work and marina replacement work could be conducted in the same vicinity at the same time. Construction schedules would need to be closely coordinated ahead of time.
        - Physical modifications to the bulkhead could impact the gangway attachments, utility passages through the wall, and even upland equipment locations (e.g., electrical subpanels).
        - Construction of a new bulkhead would typically involve building a completely new wall in front of the existing one (typically within ~3'). This would encroach on the berthing area of the landward most slips at each dock. If this necessitates reconfiguration of the replacement marina outside the existing footprint (or pushing it out into the creek further), this will require more extensive planning and permitting approval efforts, which may be met with push-back from the Morgan Creek boating community.
    - No matter the timing or actual scope of the bulkhead project and WDYH replacement, both projects should be coordinated to ensure needs of each project are known and included in the planning, design, and construction of the other, especially with respect to those items mentioned above.

- Jet Docks
    - The use of jet-docks has become commonplace as an add-on installation in existing marinas and incorporated into new project designs.
    - While not usually considered for existing marinas, use of jet-docks may impact design loads for pile anchors of floating docks, as well as cleat loads. If jet-dock installations at the replacement facility are known during the planning phase of the project, these can be incorporated into the design.
    - Some marinas have opted to remove finger docks entirely and used a continuous row of jet docks to serve as berthing. This increases the number of slips and decreases overall new floating dock square footage (and associated costs) but must be considered carefully and approved by all stakeholders/slip holders as it represents a different approach to vessel berthing, boarding, etc. This configuration would also require increased regulatory approval efforts as it is not within the existing footprint.
    - Regulatory permit approval will be required for any jet-dock installations, unless already approved.

Closing

It has been our pleasure to provide this information to you. As always, we enjoy supporting the WDYH. If you have any questions or would like to discuss any aspect of the replacement cost estimate, please do not hesitate to call me directly.

Attachments

WDYH Marina Replacement Cost Estimate
Prepared 12/21/2020

Item Number	Description	Quantity	Units	Unit Price	Total Price	Comments
	Preliminaries					
1	Mobilization	1	LS	$45,000	$45,000	Based on recent ATM experience at nearby local project
2	Bonding/Insurance	% of Cost	%	1.0%	$26,336	Based on recent/historic project experience
	Replacement Costs					
	Dock A					
A.1	Demolition	1,625	SF	$12	$19,500	Including docks, piles, utilities, recycling/salvage of appropriate infrastructure, etc.
A.2	Floating Docks and Anchor Pilings	1,625	SF	$65	$105,625	Floating Timber Docks with Pile Anchorage (neglecting current COVID impacts)
A.3	Marina Utilities (Shore Power and Potable Water)	12	SLIP	$9,500	$114,000	Pedestals - Including Shore Power and Potable Water Service
A.4	Fire Pedestals	2	EA	$2,000	$4,000	Pedestals and extinguishers as per NFPA 303
A.5	Fire - Fixed Standpipe System	1	EA	$6,480	$6,480	Per NFPA 303
A.6	Lifting Ladders	1	EA	$300	$300	Basic aluminum retractable 3-step
A.7	Gangway (3' x 25')	1	EA	$8,000	$8,000	
A	Dock Sub Total				$257,905	
					Add-On	
Alt A.1	*Aluminum Frame Floating Docks*	*1,625*	*SF*	*$78*	*$20,719*	*Add to Dock Sub Total for Aluminum Frame Floating Docks*
Alt A.2	*Concrete Floating Docks*	*1,625*	*SF*	*$120*	*$89,375*	*Add to Dock Sub Total for Concrete Unit Floating Docks*
	Dock B					
B.1	Demolition	4,230	SF	$12	$50,760	Including docks, piles, utilities, recycling/salvage of appropriate infrastructure, etc.
B.2	Floating Docks and Anchor Pilings	4,230	SF	$65	$274,950	Floating Timber Docks with Pile Anchorage (neglecting current COVID impacts)
B.3	Marina Utilities (Shore Power and Potable Water)	21	SLIP	$9,500	$199,500	Pedestals - Including Shore Power and Potable Water Service
B.4	Fire Pedestals	5	EA	$2,000	$10,000	Pedestals and extinguishers as per NFPA 303
B.5	Fire - Fixed Standpipe System	1	EA	$19,440	$19,440	Per NFPA 303
B.6	Lifting Ladders	1	EA	$300	$300	Basic aluminum retractable 3-step
B.7	Gangway (3' x 25')	1	EA	$8,000	$8,000	
B	Dock Sub Total				$562,950	
					Add-On	
Alt B.1	*Aluminum Frame Floating Docks*	*4,230*	*SF*	*$78*	*$53,933*	*Add to Dock Sub Total for Aluminum Frame Floating Docks*
Alt B.2	*Concrete Floating Docks*	*4,230*	*SF*	*$120*	*$232,650*	*Add to Dock Sub Total for Concrete Unit Floating Docks*
	Dock C					
C.1	Demolition	4,386	SF	$12	$52,632	Including docks, piles, utilities, recycling/salvage of appropriate infrastructure, etc.
C.2	Floating Docks and Anchor Pilings	4,386	SF	$65	$285,090	Floating Timber Docks with Pile Anchorage (neglecting current COVID impacts)
C.3	Marina Utilities (Shore Power and Potable Water)	24	SLIP	$9,500	$228,000	Pedestals - Including Shore Power and Potable Water Service
C.4	Fire Pedestals	5	EA	$2,000	$10,000	Pedestals and extinguishers as per NFPA 303
C.5	Fire - Fixed Standpipe System	1	EA	$19,440	$19,440	Per NFPA 303
C.6	Lifting Ladders	1	EA	$300	$300	Basic aluminum retractable 3-step
C.7	Gangway (3' x 25')	1	EA	$8,000	$8,000	
C	Dock Sub Total				$603,462	
					Add-On	
Alt C.1	*Aluminum Frame Floating Docks*	*4,386*	*SF*	*$78*	*$55,922*	*Add to Dock Sub Total for Aluminum Frame Floating Docks*
Alt C.2	*Concrete Floating Docks*	*4,386*	*SF*	*$120*	*$241,230*	*Add to Dock Sub Total for Concrete Unit Floating Docks*
	Dock D					
D.1	Demolition	4,248	SF	$12	$50,976	Including docks, piles, utilities, recycling/salvage of appropriate infrastructure, etc.
D.2	Floating Docks and Anchor Pilings	4,248	SF	$65	$276,120	Floating Timber Docks with Pile Anchorage (neglecting current COVID impacts)
D.3	Marina Utilities (Shore Power and Potable Water)	24	SLIP	$9,500	$228,000	Pedestals - Including Shore Power and Potable Water Service
D.4	Fire Pedestals	5	EA	$2,000	$10,000	Pedestals and extinguishers as per NFPA 303
D.5	Fire - Fixed Standpipe System	1	EA	$19,440	$19,440	Per NFPA 303
D.6	Lifting Ladders	1	EA	$300	$300	Basic aluminum retractable 3-step
D.7	Gangway (3' x 25')	1	EA	$8,000	$8,000	
D	Dock Sub Total				$592,836	
					Add-On	
Alt D.1	*Aluminum Frame Floating Docks*	*4,248*	*SF*	*$78*	*$54,162*	*Add to Dock Sub Total for Aluminum Frame Floating Docks*
Alt D.2	*Concrete Floating Docks*	*4,248*	*SF*	*$120*	*$233,640*	*Add to Dock Sub Total for Concrete Unit Floating Docks*
	Dock E					
E.1	Demolition	3,970	SF	$12	$47,640	Including docks, piles, utilities, recycling/salvage of appropriate infrastructure, etc.
E.2	Floating Docks and Anchor Pilings	3,970	SF	$65	$258,050	Floating Timber Docks with Pile Anchorage (neglecting current COVID impacts)
E.3	Marina Utilities (Shore Power and Potable Water)	24	SLIP	$9,500	$228,000	Pedestals - Including Shore Power and Potable Water Service
E.4	Fire Pedestals	5	EA	$2,000	$10,000	Pedestals and extinguishers as per NFPA 303
E.5	Fire - Fixed Standpipe System	1	EA	$19,440	$19,440	Per NFPA 303
E.6	Lifting Ladders	1	EA	$300	$300	Basic aluminum retractable 3-step
E.7	Gangway (3' x 25')	1	EA	$8,000	$8,000	
E	Dock Sub Total				$571,430	
					Add-On	
Alt E.1	*Aluminum Frame Floating Docks*	*3,970*	*SF*	*$78*	*$50,618*	*Add to Dock Sub Total for Aluminum Frame Floating Docks*
Alt E.2	*Concrete Floating Docks*	*3,970*	*SF*	*$120*	*$218,350*	*Add to Dock Sub Total for Concrete Unit Floating Docks*
	Construction Cost Sub Total				**$2,659,919**	**Base Price**
	Soft Costs					
	Planning, Permitting, Engineering, Construction Phase Services	% of Cost	%	4.5%	$119,696	
	Contingency					
	Overall Contingency	% of Cost	%	10%	$277,962	
	TOTAL				**$3,057,577**	**Single Full Marina Replacement Project Base Price**
Alt 1 Total	*Aluminum Frame Floating Docks*	*18,459*	*SF*	*$78*	*$235,352*	*Add to Total for Aluminum Frame Floating Docks*
Alt 2 Total	*Concrete Floating Docks*	*18,459*	*SF*	*$120*	*$1,015,245*	*Add to Total for Concrete Unit Floating Docks*
Phasing	*Additional Mobilization for Each Phase*	*1*	*EA*	*$45,000*	*$45,000*	

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